

4/PRTS

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An Article of FootwearIntroduction

The invention relates to an article of footwear, and specifically a slipper. In particular, the invention relates to an article of footwear which is adapted to provide heat to a users foot. The invention also relates to a method of heating a users foot using the article of footwear of the invention.

There are a number of known shoes, boots or slippers of the type having material inserts, or packs in the lining or sole, which are suitable for heating. These generally fall into one of three types. The first type consists of a natural material such as corn, wheat or nuts which is housed in an encapsulant which itself can be heated, along with the shoe in which it is carried, in a microwave. One problem with this type of material is that it's heat retention characteristics are poor, as it stays warm for only about 15 minutes. Additionally, as the

1 natural material only holds a very small amount of  
2 water, the equilibrium temperature of the material  
3 does not get above 80°C. Further, upon heating, the  
4 water can escape from the natural material as water  
5 vapour resulting in a decrease in the amount of  
6 water over time and a consequential decrease in the  
7 equilibrium temperature of the material. Further,  
8 the nature of the material is such as to give off an  
9 odour during heating which for most people is  
10 unacceptable. A further, major, drawback of these  
11 types of products is that bunching can occur, this  
12 being the natural tendency of the material when  
13 agitated to migrate into low pressure areas of the  
14 article of footwear. Generally these areas are ones  
15 which do not require heat.

16  
17 A further type of microwaveable insert comprises the  
18 use of a dessicant instead of a natural material.  
19 While the use of a dessicant overcomes the odour  
20 problem, it has been found to be ineffective in  
21 overcoming the heat retention or bunching problem.  
22 The heat retention problem is due, in part, to the  
23 small amounts of water that dessicant can hold.

24  
25 A further type of microwaveable insert for shoes and  
26 slippers comprises an encapsulated gel. Generally  
27 these gels include a thickening agent, normally a  
28 super absorbent polymer. Due to the presence of a  
29 thickening agent, the gels have a very poor thermal  
30 conductivity, due to the fact that the liquid cannot  
31 generate convective currents. Thus, when heated in a  
32 microwave, hot spots can occur within the insert.

1 Due to the poor thermal conductivity within such  
2 products, it is generally necessary when microwaving  
3 the insert to microwave it for a period of time on  
4 one side, and then turn the product over and  
5 microwave it for a further period of time, with a  
6 view to homogenising the amount of heat dissipated  
7 from the surfaces of the insert. Often, to  
8 sufficiently microwave one of these products, three  
9 or more microwaving steps are required.

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11 International Patent Application Number WO94/28834  
12 in the name of JMK International Inc. describes (in  
13 Figures 3 and 4) a microwaveable slipper. The  
14 slipper comprises a number of microwaveable heating  
15 pads which are integrally built into the sole and  
16 upper portion of the shoe. As such, in order to heat  
17 the product it is necessary to insert the whole  
18 product into a microwave.

19

## 20 Statements of Invention

21

22 Surprisingly, the Applicant has realised a number of  
23 problems inherent in using the slipper disclosed in  
24 International Patent Application WO94/28843. A first  
25 problem is the problem of malodour being produced as  
26 a result of microwaving the whole slipper. As will  
27 be readily evident to the reader, as a user  
28 generally uses a slipper without socks, the slippers  
29 are prone to becoming soiled with sweat, dirt from  
30 the users feet, dead skin etc. Thus, when the  
31 slipper is heated, it is prone to producing a bad  
32 smell. This problem is further exacerbated by the

1 fact that most microwaves are predominantly used to  
2 heat or reheat food products. As such, one would be  
3 quite disinclined to place a food product in a  
4 microwave which had just been used to heat a  
5 slipper. Likewise, if the sole of the slipper has  
6 picked up any dirt, it is likely that the user will  
7 be less inclined to place it in a microwave.

8

9 Accordingly, the invention provides an article of  
10 footwear comprising an upper portion and a sole  
11 portion, the sole portion being connectable to the  
12 upper portion and including a pocket for receipt of  
13 a microwaveable heating pad, wherein the article is  
14 adapted for removal and insertion of the heating  
15 pad.

16

17 Thus, an article of footwear according to the  
18 invention obviates the problems described above due  
19 to the fact that the microwaveable heating pad may  
20 be easily removed from the article of footwear and  
21 placed into the microwave for heating in the absence  
22 of the article of footwear.

23

24 In a preferable embodiment of the invention, the  
25 upper portion and the sole portion are detachable  
26 along at least a portion of a circumference of the  
27 article to allow access to the pocket for insertion  
28 and removal of the microwaveable heating pad.

29

30 In one embodiment of the invention, the upper  
31 portion and the sole portion are connected by means  
32 of a detachable fastener, such as, for example, a

1 zip. Many other types of detachable fasteners are  
2 envisaged such as, for example, velcro, a hook and  
3 eye arrangement, buttons, press studs, and the like.  
4 In one embodiment of the invention, the openable  
5 fastener extends completely around the circumference  
6 of the article of footwear. Alternatively, the  
7 openable fastener may only extend along a portion of  
8 the article of footwear, such as, for example around  
9 a heel of the article of footwear.

10

11 In one embodiment of the invention the pocket is  
12 dimensioned for receipt of an insole-sized  
13 microwaveable heating pad.

14

15 Typically, the upper portion is adapted to at least  
16 partially enclose a users foot, and includes a base  
17 upon which, in use, a users foot rests. Generally,  
18 the base is formed from a fabric material.

19

20 In one particularly preferred embodiment of the  
21 invention, the article of footwear includes a solid,  
22 microwaveable, heating pad which is dimensioned to  
23 fit into the pocket of the article of footwear.

24

25 In one embodiment, the heating pad comprises a  
26 mixture of ferrite and silicone. Typically, the  
27 heating pad comprises a mixture of ferrite and  
28 silicone in a ratio of between 4:1 and 1:4 (W/W).

29 In a preferred embodiment, the ratio of ferrite and  
30 silicone is approximately 2:1 (W/W).

31

1 Preferably the sole portion of the article of  
2 footwear includes an insulating layer located  
3 underneath the pocket. Typically the insulating  
4 layer comprises a foam cushion. Ideally, the foam  
5 cushion comprises EPDM foam. Suitably, the sole  
6 portion includes an outsole. In one embodiment, the  
7 outsole comprises a thermoplastic elastomer.

8

9 The invention also relates to an article of footwear  
10 comprising:

- 11 - an upper portion dimensioned to at least
- 12 partially enclose a users foot;
- 13 - a sole portion connectable with the upper
- 14 portion; and
- 15 - a solid microwaveable insole-shaped heating pad,
- 16 wherein the sole portion includes a pocket which is
- 17 dimensioned for receipt of the heating pad and
- 18 wherein the article is adapted for removal and
- 19 insertion of the heating pad.

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21 The invention also relates to a method of heating a  
22 foot comprising the steps of:

- 23 - providing an article of footwear according to the
- 24 invention;
- 25 - removing the heating pad from the pocket of the
- 26 article of footwear;
- 27 - heating the heating pad in a microwave for a
- 28 suitable amount of time;
- 29 - inserting the thus-heated heating pad into the
- 30 pocket of the article of footwear; and
- 31 - inserting the foot to be heated into the article
- 32 of footwear.

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2 Brief Description of the Drawings

3

4 The invention will be more clearly understood from  
5 the following description of an embodiment thereof,  
6 given by way of example only, with reference to the  
7 accompanying drawings in which:-

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9 Fig 1a is a side elevational view of an article of  
10 footwear according to the invention;  
11 Fig 1b is an elevational view from an opposite side  
12 of the article footwear of Fig 1a;  
13 Fig 2a is a side elevational view of the article of  
14 footwear of Fig 1a with the upper portion shown  
15 partially detached from the sole portion revealing a  
16 pocket into which a microwaveable heating pad is  
17 receivable;  
18 Fig 2b is a view similar to Fig 2a showing a  
19 microwaveable heating pad partially inserted into  
20 the pocket of the sole portion;  
21 Fig 3 is an exploded view of an article of footwear  
22 according to the invention;  
23 Fig 4 is a plan view from above a sole portion  
24 forming part of the article of footwear of Fig 1a;  
25 and  
26 Fig 5 is a sectional view of the sole portion of Fig  
27 4 taken along the lines V-V of Fig 4.

28

29 Referring to the drawings, and initially to Fig 1, 2  
30 and 3, there is illustrated an article of footwear,  
31 specifically a slipper, and indicated generally by  
32 the reference numeral 1. The slipper 1 comprises an

1 upper portion 2 which is shaped to partially enclose  
2 a users foot, and a sole portion 3 which includes a  
3 pocket 5 for receipt of a microwaveable heating pad  
4 6. The upper portion 2 and sole portion 3 are  
5 connected by means of a detachable fastener in the  
6 form of a zip 7 which extends completely around a  
7 circumference of the slipper 1.

8

9 In more detail, and referring to Fig 3, the upper  
10 portion 2 is formed of a thick cotton plush material  
11 which at least partially encloses the users foot and  
12 includes a fabric base portion 4 upon which, in use,  
13 the user's foot abuts. A first part of the zip 7  
14 extends round a circumference of the base 4 of the  
15 upper portion 2.

16

17 The sole portion 3 comprises an outsole 10 formed of  
18 a thermoplastic elastomer having a second part of  
19 the zip 7 attached along an upper circumference  
20 thereof. The sole portion 3 additionally includes  
21 an EPDM cushion 11 which is located within the  
22 outsole 10 and which, in use, insulates the heated  
23 insole and deflects heat upwards towards a foot of a  
24 user. The pocket 5 for receiving the microwaveable  
25 heating pad 6 is located within the sole portion 3  
26 directly above the EPDM foam cushion 11. As is  
27 clearly illustrated in Fig's 3,4 and 5, the  
28 microwaveable heating pad has an insole shape and is  
29 dimensioned for fitting snugly within the pocket of  
30 the sole portion 3.

31



1 The microwaveable heating pad 6 comprises a 2:1  
2 (W/W) mixture of ferrite and silicone, which is  
3 formed into the shape of an insole.  
4

5 In use and referring to Fig's 2a and 2b, the  
6 microwaveable heating pad 6 is first removed from a  
7 slipper 1 by opening the zip 7 to reveal the heating  
8 pad 6 within the sole portion 3. The pad 6 is  
9 removed from the sole portion 3 and placed in a  
10 microwave for heating for a suitable period of time.  
11 Thus, for example, the pad may be heated by a  
12 microwave on full power for 30 seconds. Once heated  
13 the pad 6 is removed by the microwave and placed  
14 within the pocket 5 of the sole portion 3 of the  
15 slipper 1. The pad 6 is then fixed in place within  
16 the slipper 1 by attaching the upper portion 2 and  
17 the sole portion 3 by means of the zip 7. The  
18 slipper 1 may then be worn by a user to heat the  
19 users foot.  
20

21 Although the present invention is described  
22 primarily with reference to a slipper, it will be  
23 appreciated that the invention can be applied to any  
24 article of footwear, such as, for example, a shoe, a  
25 boot, a running shoe, a football boot etc.  
26 Likewise, although the heating pad is described as  
27 comprising a mixture of ferrite and silicone, it  
28 will be appreciated that any other suitable solid  
29 microwaveable material may be used without departing  
30 from the invention. Moreover, it will be  
31 appreciated that the openable fastener connecting  
32 the upper portion and the sole portion does not need

1 to extend completely around the circumference of the  
2 article of footwear. In this regard, an opening may  
3 be provided on the article of footwear which extends  
4 around only a portion of the circumference of the  
5 article of footwear and through which the  
6 microwaveable heating pad may be inserted into the  
7 pocket. Such an opening may be closed by means of a  
8 zip, or by any other suitable closure such as, for  
9 example, a velcro fastener or the like.

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11 The invention is not limited to the embodiments here  
12 and before described which may be varied in both  
13 construction and detail without departing from the

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